Apr 12th, 11:00 AM - 12:00 PM

Respondent Learning and Fatigue in Stated Choice Experiments

Derek Lindgren
Illinois Wesleyan University

Criag Broadbent, Faculty Advisor
Illinois Wesleyan University

Derek Lindgren

RESPONDENT LEARNING AND FATIGUE IN STATED CHOICE EXPERIMENTS

Outline

- Introduction
- Literature Review
- Data & Methods
- Regression Results
- Conclusions
- Future Implications

Introduction

- Valuation of non-marketed goods
- Choice experiments
- Survey format
  - Inherent respondent patterns
    - Preference learning
    - Fatigue

Literature Review

- Discovered preference hypothesis
  - Plott (1996)
- Fatigue behavior
  - Bradley and Daly (1994)
  - Daly et al. (2012)

Data & Methods

- Middle Rio Grande Forest Restoration
  - 70 surveys; 35 hypothetical payment, 35 real-payment
  - 20 questions each, 3 alternatives
- Source: Broadbent et al. (2010)

Question Example

Question #1

	Option A	Option B	Option C
Number of non-native trees to be **removed**	10	17	Status Quo: No Change
Number of Native trees to be **planted**	1	4	
Voluntary Donation	$14	$5	

Regression Equation

- Alternative-specific conditional logit model
  - Krinsky-Robb (1986) bootstrapping procedure

$$
\begin{aligned}
y(Choice) = {} & \alpha \ (Constant) \\
& + \beta_1 \ (Exotic) \\
& + \beta_2 \ (Native) \\
& + \beta_3 \ (Donation) \\
& + \beta_4 \ (OptionA) \\
& + \beta_5 \ (OptionB) \\
& + \varepsilon \ (Error\ term)
\end{aligned}
$$

Regression Results (Pooled)

Dependent Variable: *Choice*		First 5 N = 175	Middle 10 N = 350	Last 5 N = 175
Exotic	coefficient	0.085	0.077*	0.076**
	p-value	(0.128)	(0.015)	(0.010)
	std. error	0.056	0.032	0.029
Native	coefficient	0.087	0.287**	0.494**
	p-value	(0.571)	(0.000)	(0.000)
	std. error	0.153	0.037	0.073
Donation	coefficient	-0.194**	-0.137**	-0.261**
	p-value	(0.000)	(0.000)	(0.000)
	std. error	0.038	0.027	0.046

** = statistically significant at the $p < 0.01$ level

* = statistically significant at the $p < 0.05$ level

MWTP Results

Hypothetical		First 5	Middle 10	Last 5
Exotic	coefficient	0.093	**0.808***	0.184
	p-value	(0.850)	(0.044)	(0.358)
	std. error	**0.493**	**0.400**	**0.200**
Native	coefficient	-0.315	**2.099****	**1.577****
	p-value	(0.772)	(0.001)	(0.000)
	std. error	**1.089**	**0.605**	**0.280**
Real Payment				
Exotic	coefficient	0.798	0.338	**0.376****
	p-value	(0.161)	(0.113)	(0.005)
	std. error	**0.570**	**0.213**	**0.133**
Native	coefficient	0.983	**2.067****	**2.241****
	p-value	(0.414)	(0.000)	(0.000)
	std. error	**1.204**	**0.451**	**0.332**

** = statistically significant at the p < 0.01 level

* = statistically significant at the p < 0.05 level

t-tests for Statistical Differences

Hypothetical M10 – L5	t-value
Native	0.783

Real Payment M10 - L5	t-value
Native	-0.441

Pooled Group M10 - L5	t-value
Exotic	1.080
Native	0.476

Conclusions

- Discovered preference hypothesis is confirmed by both payment groups
- *t*-tests prove inconclusive
- No fatigue is evident
- Concurs with previous study conducted last semester on Constitution Trail

Future Implications

- Optimal construction should be reviewed
  - The first few questions should have little to no weight when analyzing results
- This analysis should continue to be used in choice experiment surveys.

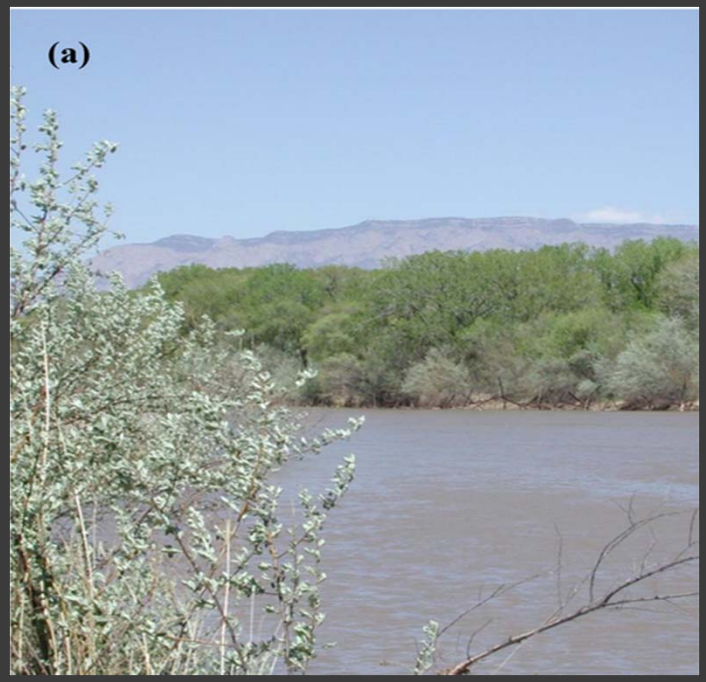
Acknowledgements

- Professor Craig Broadbent, Department of Economics at Illinois Wesleyan University

References

- Bateman, I. J., Burgess, D., Hutchinson, W. G., & Matthews, D. I. (2008). Learning design contingent valuation (LDCV): NOAA guidelines, preference learning and coherent arbitrariness. *Journal of Environmental Economics and Management, 55*(2), 127-141. doi:10.1016/j.jeem.2007.08.003
- Bradley, M., & Daly, A. (1994). Use of the logit scaling approach to test for rank-order and fatigue effects in stated preference data. *Transportation, 21*(2), 167-184. doi:10.1007/BF01098791
- Brazell, J., Louviere, J., (1997). Respondent's help, learning and fatigue. Presented at the *1997 INFORMS Marketing Science Conference,* University of California, Berkeley, 1997.
- Broadbent, C., *MRG_Final,* XLSX Format, 2014.
- Broadbent, C., Grandy, J. Berrens, R., (2010). Testing for hypothetical bias in a choice experiment using a public good: riparian forest restoration. *International Journal of Ecological Economics & Statistics, 19*(10).
- DeSarbo, W., Lehmann, D., & Hollman, F. (2004). Modeling dynamic effects in repeated-measures experiments involving preference/choice: An illustration involving stated preference analysis. *Applied Psychological Measurement, 28*(3), 186-209. doi:10.1177/0146621604264150
- Daly, A., Hensher, D. A., & Hess, S. (2012). Not bored yet--revisiting respondent fatigue in stated choice experiments. *Transportation Research: Part A: Policy and Practice, 46*(3), 626-644. doi:http://www.elsevier.com/wps/find/journaldescription.cws_home/547/description#description
- Plott, C.R., 1996. Rational individual behavior in markets and social choice processes: the discovered preference hypothesis. In: The rational foundations of economic behaviour: Proceedings of the IEA conference held in Turin, Italy - Arrow, K.J., Colombatto, E., Perlman, M., Schmidt, C. *Journal of Economic Literature, 35*(4), 2045-2046.
- Savage, S. J., & Waldman, D. M. (2008). Learning and fatigue during choice experiments: A comparison of online and mail survey modes. *Journal of Applied Econometrics, 23*(3), 351-371. doi:http://www3.interscience.wiley.com/cgi-bin/jhome/4079
- Swait, J., & Adamowicz, W. (2001). The influence of task complexity on consumer choice: A latent class model of decision strategy switching. *Journal of Consumer Research, 28*(1), 135-148. doi:10.1086/321952

Thank you!



Any questions?